



U.S. DEPARTMENT OF
ENERGY



Management of Mixed and Radioactive PCB Waste at SRS

Betsy L. Westover

SRNS / Solid Waste Engineering / HMW Design Authority Engineer

SRS Citizens Advisory Board (CAB) Meeting

November 19, 2019

Acronym List

- ACP = Area Completion Project
- CFR = Code of Federal Regulation
- DOT = Department of Transportation
- DWPF = Defense Waste Processing Facility
- FHL = F/H Laboratory
- HMW = Hazardous Mixed Waste
- HTF = H Tank Farm
- KAC = K Area Complex
- LAWV = Low Activity Waste Vault
- MW = Mixed Waste
- NNS = Nevada Nuclear Security Site
- PCB = Polychlorinated Biphenyl
- RCRA = Resource Conservation and Recover Act
- SCHWMR = South Carolina Hazardous Waste Management Regulations
- SFP = Spent Fuel Project
- SRNL = Savannah River National Laboratory
- SRS = Savannah River Site
- SWMF = Solid Waste Management Facility
- TSCA = Toxic Substances Control Act
- TSDF = Treatment, Storage and Disposal Facility
- WCS = Waste Control Specialists

Solid Waste Management Facility



Solid Waste Management Facility



Mixed Waste (MW)

- **Definition**

- A waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act (RCRA), respectively.

- **Regulatory Drivers**

- RCRA
- South Carolina Hazardous Waste Management Regulations (SCHWMMR) Chapter 61, Article 79

- **RCRA Waste Types**

- *Listed*
- *Ignitable*
- *Corrosive*
- *Reactive*
- *Toxicity Characteristic*

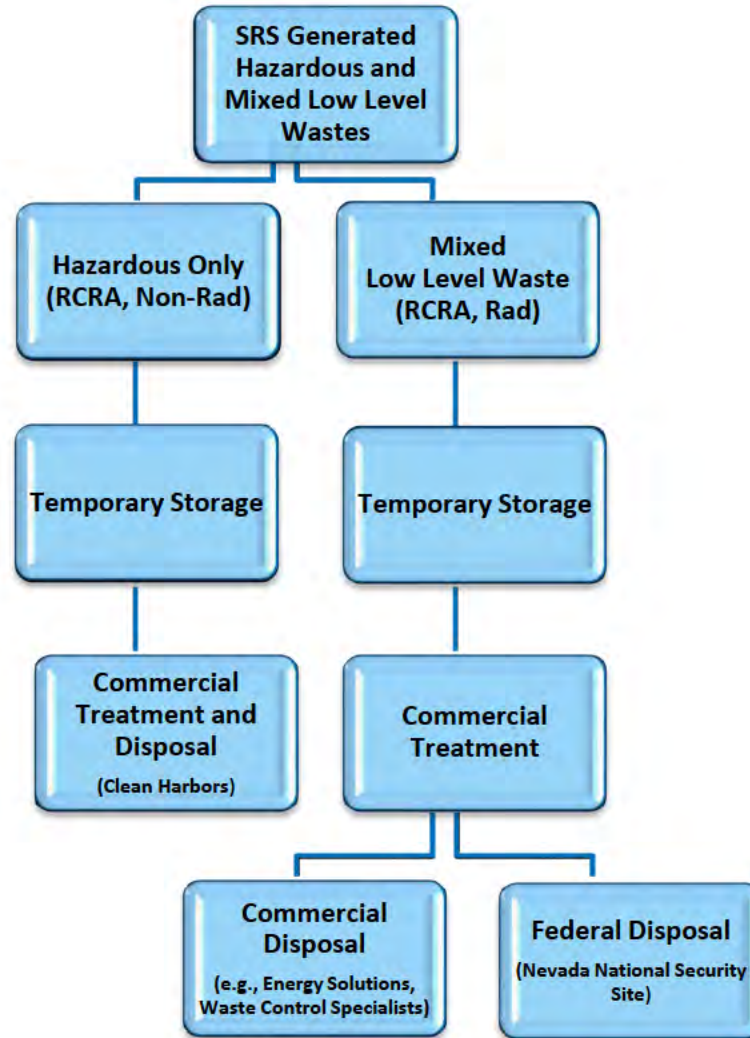
Mixed Waste (MW) cont'd

- **Examples of MW generated at SRS**

- Oils with mercury (Hg) and/or selenium (Se)
- Contaminated lead
- Zinc Bromide
- Mercury Debris
- Solvent Contaminated Rags
- Excess chemicals
- Tritium Gold Traps
- Lead-Acid Batteries
- Brass Valves
- Smoke Detectors



Mixed Waste Disposition Pathway



Mixed Waste (MW)

- **Storage**

- MW is transferred from site generators to SWMF within regulatory timeclocks (e.g., 90-Day)
- Solid Waste Management temporarily stores MW until shipped to offsite Treatment, Storage, and Disposal Facility (TSDF) for treatment/disposal
- RCRA permit allows up to one year of storage
- For MW, if the waste requires decay prior to shipment, then storage may exceed one year –
 - *SRS reports the following three MW streams in the Site Treatment Plan as stored awaiting decay*
 - Cadmium Rod Cask
 - Tritium Contaminated Equipment
 - Tritiated Oil with Mercury

- **Packaging/Shipment**

- MW is packaged in DOT compliant containers (e.g., drums, B12s, B25s)
- Use of consolidated shipments when appropriate to minimize the number of transports

Mixed Waste (MW) – cont'd

- **Where is MW typically generated at SRS?**
 - Defense Waste Processing Facility
 - H Tank Farm
 - F/H Laboratory
 - Savannah River National Laboratory
 - K Area Complex
 - Spent Fuel Project

- **Where is MW dispositioned?**
 - Perma-Fix
 - WCS / Energy Solutions
 - NNS

- **How much MW is dispositioned from SRS?**
 - A total of 107.5 m³ of MW has been dispositioned over the last 5 years
 - On average, 21.5 m³/year (ranged from 9.8 – 44.2)



Radioactive Polychlorinated Biphenyl (PCB) Waste

- **Definitions**

- Radioactive PCB Waste

- *PCB waste that also contains source, special nuclear, or byproduct material subject to regulation under the Atomic Energy Act of 1954, as amended, or naturally occurring or accelerator-produced radioactive material*

- Polychlorinated Biphenyl (PCB)

- *A family of highly toxic chemical compounds consisting of two benzene rings in which chlorine takes the place of two or more hydrogen atoms*

- **Regulatory Driver**

- Toxic Substances Control Act (TSCA) of 1976
 - 40 CFR 761

Radioactive Polychlorinated Biphenyl (PCB) Waste

- **PCB Waste Types**

- PCB Article Waste

- *Waste consisting of any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs (e.g., capacitors, transformers, electric motors, pumps, pipes and any other manufactured item)*

- PCB Bulk Product Waste

- *Waste derived from manufactured products containing PCBs in a non-liquid state at any concentration where the concentration at the time of designation for disposal was greater than or equal to 50 ppm PCBs*

- PCB Bulk Remediation Waste

- *Non-liquid PCB remediation wastes including, but not limited to soil, sediments, dredged materials, muds, PCB sewage sludge and industrial sludge*

- PCB Decontamination Waste

- *Associated PCB waste that has been separated from regulated waste during decontamination (i.e., by chopping, shredding, scraping, abrading, oil/water separation) or which were generated as a result of decontamination activities*

- PCB Remediation Waste

- *Wastes containing PCBs as a result of a spill, release or unauthorized disposal*

Radioactive PCB Waste (cont'd)

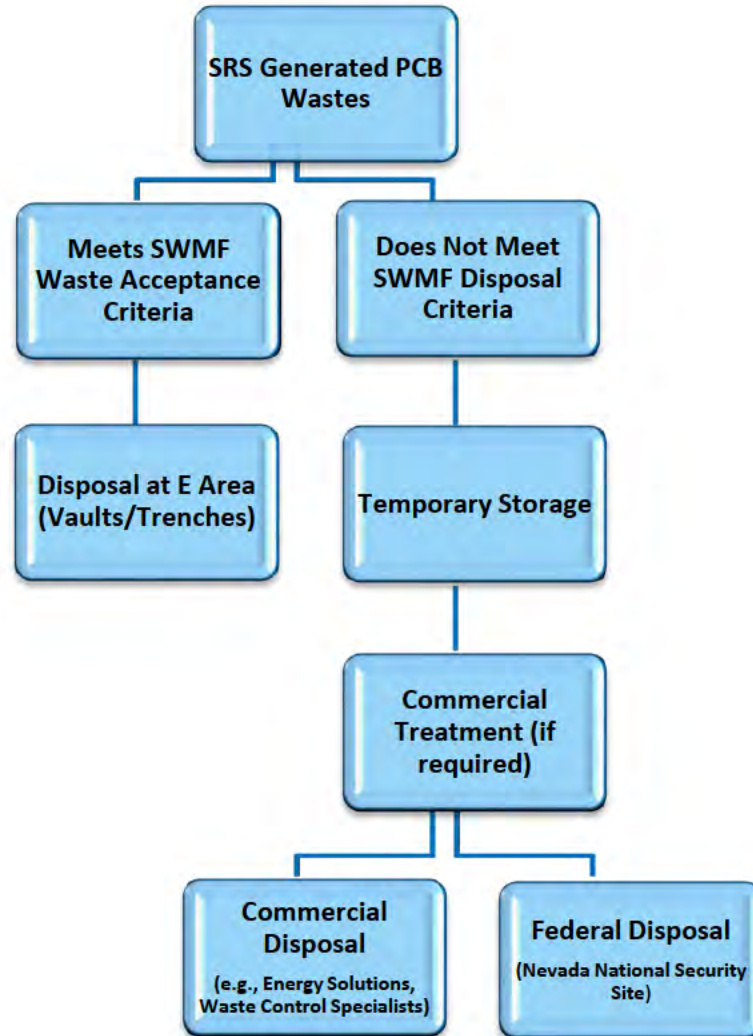
- **Examples of Radioactive PCB Waste generated at SRS**

- Light ballasts
- Painted items (building structure debris, equipment)
- Mastic on Floor Tiles
- Caulking and Roof Materials
- Cables and Wiring
- Saw cooling water “sludge”
- Emptied containers that formally held PCBs at concentrations > 500 ppm
- Oils

**Note: Rad PCB Waste could also contain RCRA constituents*



Radioactive PCB Waste



Radioactive PCB Waste (cont'd)

- **Storage/Disposal**

- E-Area

- *PCB Waste is transferred from site generators to SWMF within regulatory timeclocks (e.g., 30-Day, 180-Day), and SWMF then ensures disposal within one year time limit*
 - Trenches for PCB Bulk
 - Low Activity Waste Vault (LAWV) for light ballasts

- Offsite

- *Solid Waste Management temporarily stores PCB Waste until shipment to offsite TSDF*
 - *SWMF ships to offsite TSDF by day 270 to ensure waste can be disposed by one year time limit*
 - *PCB waste could be direct shipped from generator to offsite TSDF if timing allows*

- **Packaging/Shipment**

- PCB waste destined for offsite transport is packaged in DOT compliant containers (e.g., drums, B12s, B25s)
 - MW and Radioactive PCBs are often shipped on same transport if offsite destination is the same to minimize number of transports



Radioactive PCB Waste (cont'd)

- **Where is PCB waste typically generated at SRS?**
 - K Area Complex
 - Savannah River National Laboratory
 - Spent Fuel Project
 - Area Completion Project
- **Where is PCB Waste dispositioned?**
 - SWMF
 - Perma-Fix / WCS / Energy Solutions
 - NNSS
- **How much Radioactive PCB Waste is dispositioned from SRS?**
 - A total of 5.1 m³ of PCB Waste has been dispositioned offsite over the last 5 years
 - A total of 453 m³ of PCB Waste has been dispositioned onsite at SWMF over the last 5 years

Questions?

